

CLAIMS

1. A connection board comprising an insulating resin composition layer formed of one layer or two or more layers and a connection conductor which is formed so as to pass through the insulating resin composition layer in its thickness direction at least at a position where a conductor circuit is connected.
2. The connection board according to claim 1 further comprising a conductor circuit which is electrically connected to the connection conductor for at least one surface of the connection board.
3. The connection board according to claim 2, wherein the conductor circuit is a metallic layer.
4. The connection board according to any one of claims 1 to 3, wherein an exposed portion of the connection conductor is covered with metal.
5. The connection board according to any one of claims 1 to 4, wherein one of the insulating resin compositions placed at front and rear outermost layers of the connection board is or both of them are mainly made of thermoplastic resin.
6. A manufacturing method of connection board comprising the steps of selectively removing a first metallic layer of composite metallic layer formed of, at least, second metallic layer serving as carrier and the first metallic layer with different removal condition from the second metallic layer to form a connection conductor; forming an insulating resin

composition layer of one layer or two or more layers so as to cover at least side surfaces of the connection conductor; and polishing the insulating resin composition layer such that the connection conductor is exposed.

7. The method of manufacturing connection board according to claim 6, wherein the composite metallic layer is formed of the first metallic layer, the second metallic layer and a third metallic layer which is disposed between the first metallic layer and the second metallic layer and has different removal condition from those of the first and second metallic layers, the first metallic is selectively removed so that the connection conductor is formed, and then the third metallic layer is selectively removed.

8. The manufacturing method of connection board of claim 6 or 7, wherein a roughening treatment is performed for a surface of exposed second metallic layer at which the insulating resin composition layer is formed.

9. The manufacturing of connection board according to any one of claims 6 to 8 further comprising a step of selectively removing the second metallic layer and forming the conductor circuit after polishing the insulating resin composition layer so that the connection conductor is exposed.

10. (Amended) The manufacturing method of connection board according to any one of 6 to 9 further comprising a step of additionally forming a metallic film on the exposed surface of the connection conductor and/or the surface of conductor circuit formed so that the exposed surface of the connection

conductor is included after polishing the insulating resin composition layer so that the connection conductor is exposed.

11. The manufacturing method of connection board according to any one of claims 6 to 10, wherein an adhesive sheet made of at least one insulating resin composition is mounted so as to cover the connection conductor, heated and pressed, and thus the insulating resin composition layer is formed.

12. The manufacturing method of connection board according to any one of claims 6 to 11, wherein the side of composite metallic layer with the connection conductor being thereon at which the connection conductor is not formed is opposed to one side or both sides of supporting substrate which is larger than the corresponding side of composite metallic layer and has higher stiffness than the composite metallic layer and mounted thereon, predetermined manufacturing steps are performed for a resultant laminate and then the supporting substrate is removed therefrom.

13. A multi-layer wiring board in which connection conductors or a connection conductor and conductor circuit of at least two connection boards obtained by being arbitrarily selected from connection boards according to any one of claims 1 to 5 are made into an alloy by solid phase metallic diffusion or melt bonding and conductive connected with each other, and the connection boards are mechanically connected with each other by an insulating resin composition.

14. The multi-layer wiring board according to claim 13, wherein an insulating resin composition layer of the connection

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board is a liquid crystal polymer.

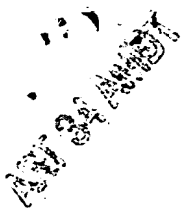
15. A manufacturing method of multi-layer wiring board comprising the steps of: aligning at least two connection boards obtained by the manufacturing method of connection board according to any one of claims 6 to 12; and heating, pressing and laminating at a time the aligned connection boards, so that the connection conductors or the connection conductor and the conductor circuit are made into an alloy by solid phase metallic diffusion or melt bonding and conductive connected with each other, and the connection boards are mechanically connected with each other by an insulating resin composition.

16. The manufacturing method of multi-layer wiring board according to claim 15, wherein a liquid crystal polymer is used for an insulating resin composition layer of the connection board.

17. The manufacturing method of multi-layer wiring board according to claim 15 or 16 further comprising a step of forming an outer layer circuit after the step of heating, pressing and laminating at a time.

18. The manufacturing method of multi-layer wiring board according to any one of claims 15 to 17, wherein a substrate having a conductor circuit and/or a metallic foil is laminated at a time together with the connection board.

19. A substrate for semiconductor package manufactured by the multi-layer wiring board according to claim 13 or 14 or the multi-layer wiring board obtained by the manufacturing method according to any one of claims 15 to 18.



20. The substrate for semiconductor package according to claim 19 comprising a cavity at a position where a semiconductor chip is mounted.

21. A manufacturing method of substrate for semiconductor package comprising the manufacturing method of multi-layer wiring board according to any one of claims 15 to 18.

22. The manufacturing method of substrate for semiconductor package according to claim 21 further comprising a step of forming a cavity at a position that a semiconductor chip is mounted.

23. A semiconductor package manufactured by using the substrate for semiconductor package according to claim 19 or 20.

24. A manufacturing method of semiconductor package comprising the manufacturing method of substrate for semiconductor package according to claim 21 or 22.

25. The manufacturing method of semiconductor package according to claim 24 further comprising a step of connecting a semiconductor chip to a conductor circuit.

26. The manufacturing method of semiconductor package according to claim 24 or 25 further comprising a step of sealing the semiconductor chip by a resin.